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*Regularity and local monodromy of the non-commutative Gauss-Manin connection.*

Given a topological fiber bundle  $X \rightarrow B$ , de Rham cohomology of the fibers with coefficients in the complex numbers forms a vector bundle over  $B$ . Nearby fibers of this vector bundle are identified via a flat connection called the *Gauss-Manin* connection. If, further, the fibration is a smooth map of complex algebraic varieties, the Gauss-Manin connection enjoys nice analytic properties which imply, among other things, that the monodromy around any embedding of a punctured unit disk into  $B$  has eigenvalues which are roots of unity. Proving this result is surprisingly tricky. The original proof uses Hironaka's resolution of singularities, and there is another proof by Nick Katz which uses characteristic- $p$  methods.

I will present joint work with Vadim Vologodsky which generalises this result to the non-commutative world, where the fiber bundle of spaces is replaced by a family of categories. The proof goes through descent to characteristic  $p$  and uses some recent ideas of “noncommutative Hodge Theory” pioneered by Kaledin and Vologodsky. (Received August 21, 2013)